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ABSTRACT

To examine changes in tobacco use among high school students in Alabama from 1995 to 1999, Alabama Youth Risk Behavior Surveillance System (YRBS) survey data were analyzed. The survey has been used since 1990 to examine the health practices of adolescents and to monitor priority health-risk behaviors that contribute to the leading causes of mortality, morbidity, and social problems among youth. The YRBS specifically monitors (1) behaviors that contribute to unintentional and intentional injuries; (2) tobacco use; (3) alcohol and other drug use; (4) sexual behaviors that contribute to unintended pregnancy and sexually transmitted disease; (5) dietary behaviors; and (6) physical activity. Analysis showed that Alabama adolescent risk behaviors pose serious threats to their health. These risk behaviors are strongly linked to significant indicators of social and psychological well-being, including education, job performance, quality of family and social relationships, and economic stability of the state. (Contains 6 tables and 12 references.) (JDM)

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Trends in Tobacco Use by Alabama Youth (1995-1999)

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of the Mid-South Educational Research Association

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Running head: Tobacco use and Alabama Youth

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Introduction

Cigarettes are the most commonly used daily substance by youth. One of the 10 leading health indicators that reflect the major health concerns in the United States is cigarette smoking among adolescents (Healthy People 2010, 2000). According to a U.S. surgeon general's report on women and smoking released on March 27, 2001, teenage girls are lighting up cigarettes in alarming numbers, a trend that over the last decade has threatened to wipe out progress made by anti-smoking campaigns during the 1970s and 1980s. Women now account for 39% of smoking-related deaths, a proportion that has more than doubled since 1965.

One of the special concerns regarding youth risk behaviors is the reported increase in rates for daily smoking for 9th, 10th, 11th and 12th grade students. Thirty-three percent of ninth graders were current smokers in 1997, as were 40% of high school seniors. (CDC, 1997).

The long-term deleterious effects of cigarette use have been well described. Smoking has been lined to lung cancer, coronary heart disease, and malignancies. Passive smoke has been associated with lung cancer in nonsmokers. While few adolescents die of these complications, it is during their teen years that young people begin tobacco use that undoubtedly contributes to adult disease. First-time tobacco use is nearly always initiated before graduation from high school (U. S. Department of Health and Human Services, 1994b). Silvis & Perry (1997) reported that of those teenagers who are able to smoke two cigarettes to completion, 85% would become regular smokers. They have difficulty trying to quit smoking.

Those youth at highest risk for tobacco use include youth with low school achievement, with friends who use tobacco, and those with lower self-esteem. Of those young people who use marijuana, alcohol, or other drugs, tobacco is often their gateway drug (U. S. Department of Health and Human Services, 1994b). Despite the fact that 48 states and the District of Columbia prohibit the sale of tobacco products to minors, the majority of smokers between the ages of 12 and 17 reports buying their own cigarette (CDC, 2000a).

"Young kids will mimic the message their parents tell them and say 'smoking is bad.' But as children get more into society, they are exposed to tactics of the advertising industry and it becomes too seductive," said Janet Williams of the Cook County Department of Public Health, a member of the Illinois Coalition Against Tobacco. "Tobacco industries prey on insecurities of youth." At the same time, spending for domestic cigarette advertising and promotion was $8.24 billion in 1999, it is an increase of 22% from 1998 (Slate Magazine, 2001).

About one in five women smokes -- compared with one in four men -- a rate that has stayed consistent in the last decade (Simon, 1995). Last year, a government survey found that 30 percent of female high school seniors reported they had smoked in the previous month, an increase from the early 1990s. Schools, grappling with the growing problem, have tried not only punishment but also treatment, like counseling or providing nicotine patches to students.

To examine changes in tobacco use among high school students in Alabama from 1995 to 1999, Alabama youth risk behavior survey (YRBS) data were analyzed

Method

This study used Alabama Youth Risk Behavior Surveillance System (YRBS) surveys for 1995, 1997, and 1999 as the raw data sources. The subjects of this survey were high school students in Alabama aged 12 and above.

The YRBS was developed by the Centers for Disease Control and Prevention (CDC), in cooperation with state and local health departments. It has been used nationwide since 1990 to examine the health practices of adolescents, and to monitor priority health-risk behaviors that contribute to the leading causes of mortality, morbidity, and social problems among youth and adults in the United States. The YRBS monitors six categories of behaviors: (1) behaviors that contribute to unintentional and intentional injuries; (2) tobacco use; (3) alcohol and other drug use; (4) sexual behaviors that contribute to unintended pregnancy and sexually transmitted disease, including HIV infection; (5) dietary behaviors; and (6) physical activity.

YRBS reliability has been assessed using test-retest protocol. No significant differences were found between the prevalence estimates at time one and time two administration. It includes national, state, territorial, and local school-based surveys of high school students. National surveys were conducted in 1990, 1991, 1993, 1995, 1997 and 1999. Alabama has been participating in this survey since 1993.

YRBS surveys used independent, three-stage cluster samples to obtain cross-sectional data representative of students in grades 9 through 12 in the 50 states and the District of Columbia. Students completed an anonymous, self-administered questionnaire that included identically worded questions about cigarette smoking

Results

Demographic Characteristics of YRBS Data in 1995, 1997, and 1999 for Alabama

The population for this study included students who were enrolled in high school during the academic school years of 1995, 1997, and 1999 across Alabama. Data are representative of students in grades 9–12 in public and private schools.

In 1995, 3911 students were surveyed, among them 49.9 % were male students, 50.1% were female students, 61.3% were white, 34.4% were black, 1.2% were Hispanic, 31.3% were in the 9th grade, 24.9% were in the 10th grade, 22.1% were in the 11th grade, and 20.5% were in the 12th grade. The survey yielded a 76% overall response rate. In 1997, 3787 students were surveyed, among them 49.9% were male students, 50.1% were female students, 66.1% were white, 30.4% were black, 0.8% were Hispanic, 30.4% were in the 9th grade, 25.3% were in the 10th grade, 22.7% were in the 11th grade, and 19.8% were in the 12th grade. The survey yielded a 78% overall response rate. In 1999, 2095 students were surveyed, among them 50.8% were male students, 49.2% were female students, 67.6% were white, 26.1% were black, 1.9% were Hispanic, 30.2% were in the 9th grade, 25.5% were in the 10th grade, 22.2% were in the 11th grade, and 21.2% were in the 12th grade. This survey yielded a 60% overall response rate (Table 1).

Profiles of Alabama 1995, 1997, and 1999 YRBS Data regarding tobacco use

Descriptive statistics were used to compile tables that include the percentage of responses for each survey question and to generate the profiles for the past three years of data.

Item 18 was: "Have you ever tried cigarette smoking, even one or two puffs?" Seventy-two point eight percent, 74.5%, and 74.8% of students reported that they had tried cigarette smoking in the past, while 27.2%, 25.5%, and 25.2% of students reported that they had never tried cigarette smoking in 1995, 1997, and 1999 respectively. See the table below for the responses to item 18.

Responses	1995 (%)	1997 (%)	1999 (%)
Yes	72.8	74.5	74.8
No	27.2	25.5	25.2

Item 19 was: "How old were you when you smoked a whole cigarette for the first time?" Six point seven percent, 6.0%, and 5.1% of students reported that they had smoked a whole cigarette for the first time when they were 8 years old or younger. See the table below for the responses to item 19.

Responses	1995 (%)	1997 (%)	1999 (%)
Never	43.9	40.3	36.6
8 yrs or younger	6.7	6.0	5.1
9 to 10yrs old	7.5	7.7	6.6
11 to 12 yrs old	13.0	14.1	14.9
13 to 14 yrs old	17.0	18.6	24.3
15 to 16 yrs old	9.9	11.4	12.4
17 yrs or older	2.0	1.9	2.1

Item 20 was: "During the past 30 days, on how many days did you smoke cigarettes?" Sixty-nine percent, 64.5%, and 62.9% of students reported that they had not smoked cigarette during the 30 days preceding survey, while 3.6%, 4.2%, and 4.7% of students reported that they had smoked cigarettes for 10 to 19 days during the past 30 days in 1995, 1997, and 1999 respectively. See the table below for the responses to item 20.

Responses	1995 (%)	1997 (%)	1999 (%)
0 days	69	64.5	62.9
1 or 2 days	7.2	7.2	7.6
3 to 5 days	4.0	4.1	4.4
6 to 9 days	2.6	3.5	2.5
10 to 19 days	3.6	4.2	4.7

Item 21 was: "During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?" Five point five percent, 5.9%, and 5.6% of students reported that they had smoked less than one cigarette during the 30 days preceding the survey, while 1.3%, 1.4%, and 1.8% of students reported that they had smoked more than 20 cigarettes in 1995, 1997, and 1999 respectively. See the table below for the responses to item 21.

Responses	1995 (%)	1997 (%)	1999 (%)
Didn't smoke	68.5	63.8	62.8
Less than 1	5.5	5.9	5.6
1 cigarette	5.3	5.7	6.2
2 to5 cigarettes	11.5	13.5	13.8
6 to 10 cigarettes	4.8	5.4	5.7
11 to 20 cigarettes	3.1	4.3	4.2
More than 20	1.3	1.4	1.8

Item 22 was: "During the past 30 days, how did you usually get your own cigarettes?" Twelve point four percent, 13.1%, and 10.9% of students reported that they had bought their cigarettes from gas stations or stores during the past 30 days in 1995, 1997, and 1999 respectively. See the table below for the responses to item 22.

Responses	1995 (%)	1997 (%)	1999 (%)
Didn't smoke	65.9	61.5	62.8
Gas station	12.4	13.1	10.9
Vending machine	1.0	1.0	0.4
Someone bought them	5.2	7.6	10.6
Borrowed them	10.5	11.5	9.6
Stole them	1.6	1.8	1.5
Some other way	3.4	3.6	4.1

Item 23 was: "When you bought cigarettes in a store during the past 30 days, were you ever asked to show proof of age?" Five point three percent, 5.4% and 8.1% of students reported that they had been asked to show proof of age when they bought cigarettes in a store during the past 30 days, while 12.8%, 14.2%, and 12.5% of students reported that they had not been asked in 1995, 1997, and 1999 respectively. See the table below for the responses to item 23.

Responses	1995 (%)	1997 (%)	1999 (%)
Didn't buy	81.9	79.2	79.4
yes	5.3	5.4	8.1
No	12.8	14.2	12.5

Item 24 was: "During the past 30 days, on how many days did you smoke cigarettes on school property?" Ninety point one percent, 87.4%, and 89.6% of students reported that they had not smoked cigarettes on school property during the past 30 days; while 2.4%, 2.3%, and 2.6% of students answered that they had smoked cigarettes all 30 days on school property in 1995, 1997, and 1999 respectively. See the table below for the responses to item 24.

Responses	1995 (%)	1997 (%)	1999 (%)
0 days	90.1	87.4	89.6
1 or 2 days	3.1	4.5	3.3
3 to 5 days	1.5	1.9	1.5
6 to 9 days	1.0	1.6	1.1
10 to 19 days	1.0	1.4	1.1
20 to 29 days	0.9	0.9	1.0
All 30 days	2.4	2.3	2.6

Item 25 was: " Have you ever tried to quit smoking cigarettes?" Thirty-eight point seven percent, 41.0%, and 37.1% of students reported that they had tried to quit smoking, while 61.3%, 59.0%, and 62.9% of students reported that they had never tried to quit smoking in 1995, 1997, and 1999 respectively. See the table below for the responses to item 25.

Responses	1995 (%)	1997 (%)	1999 (%)
Yes	38.7	41.0	37.1
No	61.3	59.0	62.9

Item 26 was: "During the past 30 days, on how many days did you use chewing tobacco or snuff on school property?" Ninety-three point five percent, 92.9%, and 92.8% of students reported that they had not used chewing tobacco or snuff on school property during the past 30 days, while 2.0%, 1.9%, and 1.6% of students reported that they had used chewing tobacco or snuff on school property in 1995, 1997, and 1999 respectively. See the table below for the responses to item 26.

Responses	1995 (%)	1997 (%)	1999 (%)
0 days	93.5	92.9	92.8
1 or 2 days	1.8	2.1	2.2
3 to 5 days	0.9	0.8	1.3
6 to 9 days	0.5	0.9	0.9
10 to 19 days	0.7	0.9	0.8
20 to 29 days	0.7	0.5	0.4
All 30 days	2.0	1.9	1.6

Item 35 was: "During the past 30 days, on how many days did you use chewing tobacco or snuff, such as Redman, Levi Garry, Beechnut, Shoal, Shoal Bandits, or Copenhagen?" Eighty-eight point three percent, 88.1%, and 87.8% of students reported that they used smokeless tobacco in the past 30 days, while 3.4%, 3.2%, and 3.5% of students reported that they used smokeless tobacco every day in the past 30 days in 1995, 1997, and 1999 respectively. See table below for responses for item 35.

Responses	1995 (%)	1997 (%)	1999 (%)
0 days	88.3	88.1	87.8
1 or 2 days	3.4	3.0	3.7
3 to 5 days	1.4	1.6	1.3
6 to 9 days	1.2	1.4	1.0
10 to 19 days	1.2	1.6	1.8
20 to 29 days	1.0	1.2	1.0
All 30 days	3.4	3.2	3.5

Comparison between national and Alabama YRBS data and differences among subgroups of race/ethnic, gender, and grade

Statistical frequency distributions of percentage responses were used to compare three years' data profiles with the national YRBS data at the 95% confidence interval. A multivariate analysis of variance (MANOVA) and cross tabulation were made to compare percentages of three race/ethnic, gender, and grade subgroups on selected tobacco use risk behaviors. . Data are represented only for black, white, and Hispanic

students because the numbers of students from other racial/ethnic groups were too small for meaningful analysis.

Cigarette Use. Nationwide, 71.3%, 70.2%, and 70.4% of students had at some time tried cigarette smoking (even one or two puffs) in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly higher than the national percentage in this behavior over the past three years (Table 2).

In Alabama, male students were significantly more likely than female students to have ever tried cigarette smoking (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. Hispanic students were significantly more likely than black and white students to report this behavior. Black students were significantly more likely than Hispanic and white students to report this behavior in 1997. Students in the 11th grade were significantly more likely than students in the 10th and the 12th grade to have reported trying cigarette smoking in 1995 and 1997; students in the 12th grade had a higher percentage than students in other grades reporting this behavior in 1999 (Table 4 &5).

Thirty-four point eight percent, 36.4%, and 25.3% of students nationwide had smoked cigarettes on one or more of the past 30 days in 1995, 1997 and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly lower than the national percentage for the three reporting years (Table 2).

In Alabama, male students were significantly more likely than female students to have smoked cigarettes on one or more of the past 30 days (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. Black students were significantly more likely than Hispanic and white students to report this

behavior in 1995; white students were more likely than black and Hispanic students to report this behavior in 1997; and Hispanic students were more likely than black and white students in 1999. Students in the 9th grade were significantly more likely than students in the 10th, and the 12th grade to report this behavior in 1995 and 1997; students in the 12th grade had a higher percentage than students in other grades reporting this behavior in 1999 (Table 4 &5).

Nationwide, 16.1%, 16.7%, and 8.3% of students had smoked cigarettes on 20 or more of the past 30 days in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly lower than the national percentage reporting this behavior in 1995, and higher than the national percentage in 1999 (Table 2).

In Alabama, male students were significantly more likely than female students to have smoked cigarettes on 20 or more of the past 30 days (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. Hispanic students were significantly more likely than black and white students to report this behavior in all reporting years. Students in the 12th grade were significantly more likely than students in the 10th and the 11th grade to have smoked cigarettes in 1997 and 1999; students in the 11th grade had a significantly higher percentage than students in other grades reporting this behavior in 1995 (Table 4 &5).

Smokeless tobacco use. Nationwide, 11.4%, 9.3%, and 7.8% of students had used smokeless tobacco (chewing tobacco or snuff) on one or more of the past 30 days in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly higher than the national percentage on reporting this behavior (Table 2).

In Alabama, male students were significantly more likely than female students to have used smokeless tobacco on one or more of the past 30 days for all respective years (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. White students were significantly more likely than black and Hispanic students to report this behavior in 1995 and 1999. Hispanic students were significantly more likely than black and white students to have reported this behavior in 1997. Ninth grade students were significantly more likely than students in the 10th and the 12th grades to report this behavior in 1995 and 1999; students in the 12th grade had significantly higher percentages than students in other grades reporting this behavior in 1997 (Table 4 &5).

Access to cigarettes. Data about access to cigarettes are reported only for those students younger than 18 years of age who reported current cigarette use. Nationwide, 38.7%, 29.8%, and 23.5% of these students had purchased their cigarettes in a store or gas station during the past 30 days in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly lower than the national percentage in this behavior in 1995 (Table 2).

In Alabama, male students were significantly more likely than female students to have purchased cigarettes in a store or gas station (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. White students were significantly more likely than black and Hispanic students to report this behavior in 1995. Black students were significantly more likely than Hispanic and white students to report this behavior in 1997. White students were significantly more likely than Hispanic and black students to report this behavior in 1999. Twelfth grade students were

significantly more likely than students in the 10th and the 11th grade to report this behavior in 1995, 1997, and 1999 (Table 4 &5).

Approximately 77.5%, 66.7%, and 69.6% of students nationwide had not been asked to show proof of age when purchasing cigarettes in a store or gas station in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly higher than the national percentage in all reporting years in this behavior (Table 2).

In Alabama, female students were significantly more likely than male students not to have been asked to show proof of age when purchasing cigarettes in a store or gas station (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. White students were significantly more likely than black and Hispanic students to report this behavior in 1997 and 1999. Hispanic students were significantly more likely than black students to report this behavior in 1997. Twelfth grade students were significantly more likely than students in the 11th grade to report this behavior in all reporting years (Table 4 &5).

Cigarette smoking. One fourth (24.9%, 24.8%, and 24.7%) of students nationwide had smoked a whole cigarette before 13 years of age in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly lower than the national percentage for this behavior in the reporting years (Table 2).

In Alabama, female students were significantly more likely than male students to have reported smoking a whole cigarette before they were 13 years old in 1995 and 1997; male students had significantly higher percentages than female students in 1999 (Table 3). These significant gender differences were also identified for all race/ethnic and grade

subgroups. Black students were significantly more likely than Hispanic students to have smoked a whole cigarette before 13 years of age in 1995; white students had higher percentages than black students in 1997; and Hispanic students had higher reporting percentages than white students in 1999. Ninth grade students were significantly more likely than students in the 10th grade to report this behavior in 1995; students in the 10th grade had higher reported percentage than students in the 9th and the 11th grade in 1997 and 1999 (Table 4 &5).

Nationwide, 16.0%, 14.6%, and 14.0% of students had smoked cigarettes on school property on one or more of the past 30 days in 1995, 1997, and 1999 respectively (MMWR, 1996, 1998 & 2000). Alabama students were significantly lower than the national percentage for this behavior in all reporting years (Table 2).

In Alabama, male students were significantly more likely than female students to have smoked cigarettes on school property on one or more of the past 30 days (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. Hispanic students were significantly more likely than white and black students to have smoked on school property in 1995 and 1999, while white students were more likely than black students to report this behavior in 1997. Students in the 9th grade were significantly more likely than students in the 10th grade to report this behavior in 1997 and 1999, while students in the 11th grade had higher reporting percentages than students in the 9th grade in 1995 (Tables 4 &5).

Smokeless tobacco use on school property during the past 30 days was reported by 6.3%, 5.1%, and 4.2% nationwide in 1995, 1997, and 1999 respectively (MMWR,

1996, 1998 & 2000). Alabama students were significantly lower than the national percentage for this behavior in all reporting years (Table 2).

In Alabama, male students were significantly more likely than female students to have used smokeless tobacco on school property during the past 30 days (Table 3). This significant gender difference was also identified for all race/ethnic and grade subgroups. Hispanic students were significantly more likely than white and black students to have used smokeless tobacco on school property in 1997 and 1999, while black students were significantly higher than white students for this behavior in 1995. Ninth grade students were significantly more likely than students in the 11^{th} grade to report this behavior in 1995 and 1999, while students in the 12^{th} grade had significantly higher reporting percentages than students in the 9^{th} grade in 1997 (Table 4 &5).

Tobacco Use Trends of YRBS During 1995-1999 in Alabama

In order to determine if there were trends in Alabama youth risk behaviors regarding tobacco use, the responses from each of the items concerning tobacco use were regressed on year for each item. For these analyses, the independent variable is year and the dependent variable is the outcome for each item. Assumptions were examined using residual analyses for each of items. No serious departure from homoscedasticity and normality were found.

For each regression model, the .01 level of significance was used as the criteria to help reduce the chance of error since 10 tests were run. In each case where the significance was less than or equal to .01 ($p<=.01$), the sign of the coefficient was observed. When the sign was positive, it indicated the item outcome increased over the three reporting years. When the sign was negative, it indicated the item outcome

decreased over the three reporting years. In addition, the sign of the coefficient indicated the unit change in the outcome variable for each change in the year.

Table 6 shows the items with increasing, decreasing, and no trends respectively. Note that 4 items showed increasing trends, only one item had a decreasing trend and 4 items that had no significant trends.

Discussion

YRBS survey data for 1995, 1997, and 1999 confirmed that Alabama high school students were engaging in health risk behaviors that could lead to short-term and long-term consequences related to their overall health and wellness. The prevalence of tobacco use is particularly disconcerting due to the young age of students (14 - 18 years old). The second YRBS category involves tobacco use that could cause serious health problems.

From 1995 to 1999, nearly 75% of Alabama students had tried smoking cigarettes, over 30% admitted they currently smoke, and 12% used smokeless tobacco. A willingness to experiment with smoking as well as current levels of tobacco use among Alabama teens is increasing among all gender, racial/ethnic, and age subgroups. Male students were more likely than female students to smoke; Hispanic students were more likely than white and black students, and the twelfth grade students had higher rates than any other grades.

Alabama youth are far more likely to smoke than previously. It will be interesting to discover what effects the tobacco company campaigns against youth smoking will yield in the next surveys. Currently, daily cigarette consumption is increasing. Alabama teens also reported an increasing number of instances where other adults would purchase cigarettes for them. New laws, or stricter enforcement of old laws, may help this.

Smoking at schools is not acceptable behavior for teens, and most don't attempt it. School enforcement of non-smoking seems to be effective despite facing greater numbers of students who smoke with greater frequency.

Despite the public's increased knowledge about health hazards associated with tobacco use, cigarette smoking remains the single most preventable cause of death both for adults and adolescents in the U.S. A number of factors have been identified as correlates of adolescent tobacco use. Among the most important for youth is smoking among peers. Other correlates of tobacco use include living with adult smokers, and intent to use tobacco (Wada, 1997). Plus, tobacco companies spent millions of dollars on tobacco advertising and promotions during the past three years, much of which seemed to be particularly aimed at youthful users.

Literature reviews suggest that schools that provide clear policy and strict enforcement for their students are the most effective schools. They have higher achievement scores and lower dropout rates. School policies can help school personnel achieve two main goals: 1). to ensure the safety and well-being of staff and students, and 2). to create an environment conducive to learning. This study's findings confirm that tobacco use prevention programs should begin in elementary school. Successful programs would include behavior modeling, role-playing, and a public commitment not to use tobacco. Tobacco-free policies appear to play a crucial role in school-based intervention to reduce smoking (Devaney, 1993).

Youth who engage in risk behaviors do not limit themselves to one such behavior, as most health risk behaviors occur in combination with other risky activities. The combinations greatly increase the likelihood of damage to the adolescents' health and

well-being. This means that knowledge of a youth's participation in one specific risk behavior can be taken as a warning signal of likely involvement in additional risk behaviors (Sells & Blum, 1996). Unfortunately, little is known about which behaviors cluster or whether the pattern of risk behaviors varies by socio-demographic factors. Since YRBS surveys concentrate on single risk behaviors such as smoking, drinking, or drug use, a limitation of this study relates to the sample selection and the self-reporting process; it is subject to self-reporting bias.

Demographic factors, socioeconomic status, personal and family financial differences also relate to patterns of youth risk behaviors among Alabama youth. Therefore, it is assumed that social and cultural factors may influence patterns and prevalence of health risk behaviors among Alabama youth. The differences among subgroups of gender, race/ethnic and grade may result from a variety of societal and individual factors that vary by socioeconomic status. It is possible that school characteristics, such as size and structure, may affect not only the prevalence of smoking, but also other health risk behaviors. Cigarette smoking was also found to be inversely related to an increase in parental education level. A nationwide study of US adolescents found that parental education level was negatively associated with many health risk behaviors (Wada, 1997).

From the complex picture that emerges, research indicates that teens' overall involvement in some specific risk-taking has declined during the past decade with fewer teens engaging in multiple risk behaviors such as teen pregnancy, suicide attempts and seat belt wearing. However, almost all risk-takers also engage in positive behaviors; they

participate in desirable family, school, and community activities. These positive connections offer untapped opportunities to help teens lead healthier lives (Kann, 1998).

It is clear that Alabama adolescent risk behaviors pose serious threats to their health during adolescence, in early adulthood, and in later life. It is also important to note that these risk behaviors are strongly linked to significant indicators of social and psychological well-being, including education, job performance, quality of family and social relationships, and economic stability in the state.

Conclusion

Understanding the pervasiveness of health behaviors as they influence a spectrum of social, economic, and health indices is valuable both for capturing the "true" magnitude of the seriousness of adolescent risk behaviors from a societal perspective. It can also assist the design of effective school health interventions with the cooperation of state law enforcement agencies, health departments, and social service departments. Educational agencies alone cannot deal with these "social risk behaviors" among Alabama youth.

Research regarding trends of negative health behaviors between the high school and college populations is needed. Such comparative data would be useful in evaluating progress of educational programs in meeting National Health Objectives for the Year 2010 and to improve health education graduate programs for preservice and inservice teachers in Alabama. Future focus group interviews should be conducted with students at each grade level to elicit in-depth information about students' motivations as well as predisposing, reinforcing, and enabling factors at home, in school and in the community.

Therefore, comprehensive, sustainable, and accountable tobacco-control programs could be established and implemented effectively in Alabama school systems. These tobacco-control programs should implement mass media anti-smoking campaigns and reduce youth access to tobacco.

Table 1

Size, response rates, and demographic characteristics of samples — Alabama, Youth Risk Behavior Surveys, 1995, 1997 and 1999

Year	Sample Size	Response Rate (%)	Sex (%)		Race/Ethnicity (%)			Grade (%)			
			Male	Female	Black	White	Hispanic	9th	10th	11th	12th
1995	3911	76	49.9	50.1	34.4	61.3	1.2	31.3	24.9	22.1	20.5
1997	3787	78	49.9	50.1	30.4	66.1	0.8	30.4	25.3	22.7	19.8
1999	2095	60	50.8	49.2	26.1	67.6	1.9	30.2	25.5	22.2	21.2

Table 3

Percentage of high school students who used tobacco by gender- Alabama, Youth Risk Behavior Survey, 1995, 1997, and 1999

Behaviors	1995		1997		1999	
	Female	Male	Female	Male	Female	Male
Life time cigarette use, even one or two puffs	68.1	78.4	71.1	78.7	72.0	77.2
One or more days current cigarette use in the past 30 days	26.1	35.9	32.2	39.5	23.6	28.1
20 or more frequent cigarette use in the past 30 days	10.4	17.1	14.2	19.4	33.0	40.0
One or more days smokeless-tobacco use in the past 30 days	2.0	21.5	1.8	22.1	1.8	23.1
One or more days purchased cigarettes at a store or gas station in the past 30 days	25.8	39.0	24.1	36.1	14.3	30.6
Were not asked to show proof of age when purchasing cigarettes	81.5	68.6	79.8	74.2	67.5	61.1
Smoked a whole cigarette before age 13	17.1	16.8	18.9	18.2	21.6	22.9
Cigarette use on school property	2.6	3.6	3.4	5.6	3.0	3.6
Smokeless-tobacco use on school property	0.2	3.4	0.3	4.0	0.3	4.1

Table 4

Percentage of high school students who used tobacco by race/ethnicity- Alabama, Youth Risk Behavior Survey, 1995, 1997, and 1999.

Behaviors	1995			1997			1999		
	Black	White	Hispanic	Black	White	Hispanic	Black	White	Hispanic
Life time cigarette use, even one or two puffs	70.8	73.6	77.5	73.1	61.1	65.2	72.9	75.4	83.3
One or more days current cigarette use in the past 30 days	7.7	7.0	5.3	3.8	6.1	na	8.8	7.3	17.2
20 or more frequent cigarette use in the past 30 days	0.4	4.2	8.1	na	na	4.3	0.2	5.3	7.1
One or more days smokeless-tobacco use in the past 30 days	1.1	4.6	4.5	7.4	na	12.0	0.9	4.8	3.4
One or more days purchased cigarettes at a store or gas station in the past 30 days	6.6	15.3	14.3	15.4	5.6	12.0	6.0	12.4	7.1
Were not asked to show proof of age when purchasing cigarettes	8.3	14.6	20.5	18.5	11.1	12.0	9.1	13.3	13.3
Smoked a whole cigarette before age 13	18.0	14.5	17.5	16.4	19.9	14.3	19.7	23.4	26.1
Cigarette use on school property	3.4	2.2	5.0	4.5	4.4	3.7	2.5	3.2	6.9
Smokeless-tobacco use on school property	2.4	0.6	Na	2.6	0.8	3.7	0.6	2.6	3.4

Table 5

Percentage of high school students who used tobacco by grade - Alabama, Youth Risk Behavior Survey, 1995, 1997, and 1999

Behaviors	1995				1997				1999			
	9th	10th	11th	12th	9th	10th	11th	12th	9th	10th	11th	12th
Life time cigarette use, even one or two puffs	70.0	74.0	75.3	73.0	73.1	73.3	77.7	75.3	71.7	72.9	74.0	80.2
One or more days current cigarette use in the past 30 days	8.5	5.9	6.0	7.5	8.9	7.1	7.2	5.9	8.5	8.7	4.6	8.9
20 or more frequent cigarette use in the past 30 days	2.2	2.9	4.2	3.3	2.6	4.3	5.0	6.5	2.1	3.5	4.1	6.8
One or more days smokeless-tobacco use in the past 30 days	4.1	3.7	2.7	3.6	3.4	2.7	1.8	3.9	5.2	2.6	3.0	3.9
One or more days purchased cigarettes at a store or gas station in the past 30 days	7.4	10.7	15.5	19.6	7.3	12.3	15.9	20.7	3.1	6.9	11.6	20.4
Were not asked to show proof of age when purchasing cigarettes	9.5	12.0	14.6	16.3	11.5	14.1	15.6	17.8	9.3	10.3	12.7	17.0
Smoked a whole cigarette before age 13	20.5	16.8	14.8	14.6	20.4	21.4	16.8	14.3	23	23.2	22.8	21.3
Cigarette use on school property	3.0	2.7	3.7	2.6	5.7	4.0	4.7	3.7	4.6	3.3	1.5	3.9
Smokeless-tobacco use on school property	2.5	1.5	1.7	1.1	2.1	1.5	1.8	3.1	2.4	1.5	2.3	2.2

Table 2

Comparison of Alabama YRBS data to the national YRBS average.

Behaviors	USA			Alabama		
	1995	1997	1999	1995	1997	1999
Life time cigarette use, even one or two puffs	71.3	70.2	70.4	73.3 (+)	74.9 (+)	74.6 (+)
One or more days current cigarette use in the past 30 days	34.8	36.4	25.3	31.0 (-)	35.8 (0)	25.8 (0)
20 or more frequent cigarette use in the past 30 days	16.1	16.7	8.3	13.7 (-)	16.8 (0)	16.9 (+)
One or more days smokeless-tobacco use in the past 30 days	11.4	9.3	7.8	11.7 (0)	11.9 (+)	12.4 (+)
One or more days purchased cigarettes at a store or gas station in the past 30 days	38.7	29.8	23.5	32.4 (-)	30.1 (0)	22.4 (0)
Were not asked to show proof of age when purchasing cigarettes	77.5	66.7	69.6	75 (+)	77 (+)	64.3 (+)
Smoked a whole cigarette before age 13	24.9	24.8	24.7	17 (-)	18.5 (-)	22.2 (-)
Cigarette use on school property	16.4	14.6	14.0	3.1 (-)	4.5 (-)	3.3 (-)
Smokeless-tobacco use on school property	6.3	5.1	4.2	1.8 (-)	2.2 (-)	2.2 (-)

Table 6
Trend Analysis of Alabama YRBS Regarding Tobacco use in Regression Model

Increased Trends during 1995 - 1999		
Item	Standardized Coefficients Beta	p value
One or more days current cigarette use in the past 30 days	.056	.000
20 or more frequent cigarette use in the past 30 days	.052	.000
One or more days purchased cigarettes at a store or gas station in the past 30 days	.033	.001
Smoked a whole cigarette before age 13	.069	.000
Decreased Trends during 1995 – 1999		
Were not asked to show proof of age when purchasing cigarettes	-.103	.000
No Trends during 1995 – 1999		
Life time cigarette use, even one or two puffs	-.019	.066
One or more days smokeless-tobacco use in the past 30 days	.006	.585
Cigarette use on school property	.007	.462
Smokeless-tobacco use on school property	-.001	.891

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